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# UNITED STATES PATENT AND TRADEMARK OFFICE

| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
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| 10/772,597 | 02/06/2004 | Urbain Alfred von der Embse | | 5182 |

| 7590 | 04/05/2007 |
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| EXAMINER |
|---|
| BAKER, STEPHEN M |

| ART UNIT | PAPER NUMBER |
|---|---|
| 2112 | |

| SHORTENED STATUTORY PERIOD OF RESPONSE | MAIL DATE | DELIVERY MODE |
|---|---|---|
| 3 MONTHS | 04/05/2007 | PAPER |

**Please find below and/or attached an Office communication concerning this application or proceeding.**

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

PTOL-90A (Rev. 10/06)

-- *The MAILING DATE of this communication appears on the cover sheet with the correspondence address* --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE __3__ MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

1)☒ Responsive to communication(s) filed on <u>30 December 2006</u>.

2a)☐ This action is **FINAL**.      2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

4)☒ Claim(s) <u>1-3</u> is/are pending in the application.

     4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) <u>1-3</u> is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

**Application Papers**

9)☒ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on <u>30 December 2006</u> is/are: a)☒ accepted or b)☐ objected to by the Examiner.

     Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

     Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

     a)☐ All   b)☐ Some *   c)☐ None of:

         1.☐ Certified copies of the priority documents have been received.

         2.☐ Certified copies of the priority documents have been received in Application No. _____.

         3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

     * See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

1) ☐ Notice of References Cited (PTO-892)

2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)

3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.

4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.

5) ☐ Notice of Informal Patent Application

6) ☐ Other: _____.

## DETAILED ACTION

### *Specification*

1.      The disclosure is objected to because of the following informalities:

On page 3, in line 9, "a-powteriori" apparently should be "a-posteriori."

On page 6, in line 15, "n" apparently should be "N."

On page 14, in lines 33 and 35, "(k=1)" apparently should be "(k)."

On page 20, in lines 23-24, "new maximum a-posterior MX replaces the maximum likelihood ML" apparently should be "new maximum a-posteriori algorithm MX replaces the maximum likelihood algorithm ML."

On page 22, in line 4, "$p(x|y)$ $p(x|y)$" apparently should be "$p(x|y)$."

On page 23, in line 4, "$p(y|x)$ $p(x)$ $p(y)$" apparently should be "$p(y|x)$ $p(x)/p(y)$."

On page 24, in line 20, "po(x'|y)" apparently should be "$p(x'|y)$."

The treatment of what apparently was once described (page 41 of the marked-up specification) as "the modification that the a-priori probability $p(x(k))=p(d(k))=0$ corresponding to setting the probability $p(d(k)=+1)-p(d(k)=-1)=1/2$" is unclear.  It is not clear why the last term "$\underline{p}(d(k))$" has been added by amendment to what is now equation 6 on page 30, in line 2.  See also what is now page 37, lines 4 and 14. It's not clear why the same last term "$\underline{p}(d(k))$" has been deleted by amendment from what is now equation 7 on page 30, in lines 7 and 8, and also from the equations on what is now page 31, lines 8 and 12, on page 31, lines 12 and 13.

Appropriate correction is required.

### *Claim Rejections - 35 USC § 112*

2.      The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly ·
> claiming the subject matter which the applicant regards as his invention.

3.      Claims 1-3 are rejected under 35 U.S.C. 112, second paragraph, as being

indefinite for failing to particularly point out and distinctly claim the subject matter which

applicant regards as the invention.

Claims 1-3 are apparently method-type claims confusingly described as a

"means" in the preambles.

In claim 1, page 1, line 10 (as numbered in the margin), "A means for the new

turbo decoding a-posteriori probability p(s,s'|y) in equations (13) of the invention

disclosure" apparently should be  "A method for performing a new turbo decoding

algorithm using a-posteriori probability p(s,s'|y) in equations (13)."

In claim 1, page 1, line 15, "MAP in turbo decoding and which comprises"

apparently should be "MAP, comprising."

In claim 1, page 2, line 32, "compolex" apparently should be "complex."

In claim 1, page 3, line 16, "equations realizes" is not grammatical.

In claim 1, page 3, line 9-22, the three clauses apparently should be "whereby"

clauses.

Claims 2 and 3 change "turbo" decoding to "convolutional" decoding, and thus

are not consistent with claim 1.

### Claim Rejections - 35 USC § 103

4.       The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

5.       Claims 1-3 are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent No. 5,815,515 to Dabiri.

Dabiri discloses generating a linearized branch metric formula by transforming the squared Euclidean distance, with the original squared Euclidean distance metric, $M_c$, expressed as (using codeword c = "x"), $M_c = (y-x)(y-x)^T$ which presumably also equals $|x-y|^2$ for a x as a single transmitted symbol. Dabiri discloses that squaring can be dispensed with by expanding $(y-x)(y-x)^T$ into $M_c = \text{SUM}_{i=1,n}\{y_i^2 - 2x_iy_i + x_i^2\} = \text{SUM}_{i=1,n}\{y_i^2\}$ + $\text{SUM}_{i=1,n}\{-2x_iy_i\}$ + $\text{SUM}_{i=1,n}\{x_i^2\}$ , which presumably equals $-y^2/2\sigma^2 + \text{Re}(yx^*)/\sigma^2 -$ $|x^2|/2\sigma^2$ for each symbol after scaling by $-1/2\sigma^2$ and upon assuming x is real so that $2xy$ $= 2\text{Re}(yx^*)$. Dabiri further discloses eliminating the $\text{SUM}_{i=1,n}\{y_i^2\}$ term because it is common to all metrics, thus leaving $-\text{Re}(yx^*)/\sigma^2 - |x^2|/2\sigma^2$ for each symbol after scaling by $-1/2\sigma^2$. Dabiri discloses using this simplified branch metric in a Viterbi decoder, not a turbo decoder. It would have been obvious to a person having ordinary skill in the art at the time the invention was made to apply Dabiri's teaching of branch metric equation simplification, which uses expansion of the terms squared and deletion of the $y^2$ term, to the prior art metric $|x-y|^2/2\sigma^2$ acknowledged by applicant, thus yielding the "new" branch metric $-\text{Re}(yx^*)/\sigma^2 - |x^2|/2\sigma^2$ for Viterbi decoding or turbo decoding.

### *Response to Arguments*

6.      Applicant's arguments filed 30 December 2006 have been fully considered but

they are not persuasive.

The examiner is unable to completely follow applicants argument that there is "no

reason" to use Dabiri's metric for convolutional code decoding, because Dabiri actually

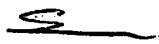uses his metric for convolutional code decoding.

### *Conclusion*

7.      Any inquiry concerning this communication or earlier communications from the

examiner should be directed to Stephen M. Baker whose telephone number is (571)

272-3814.  The examiner can normally be reached on Monday-Friday (11:00 AM - 7:30

PM).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's

supervisor, Albert DeCady can be reached on (571) 272-3819.  The fax phone number

for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the

Patent Application Information Retrieval (PAIR) system. Status information for

published applications may be obtained from either Private PAIR or Public PAIR.

Status information for unpublished applications is available through Private PAIR only.

For more information about the PAIR system, see http://pair-direct.uspto.gov. Should

you have questions on access to the Private PAIR system, contact the Electronic

Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a

USPTO Customer Service Representative or access to the automated information

system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Stephen M. Baker
Primary Examiner
Art Unit 2133

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